

REMARKS

The claims have been amended to improve the style of this application.

Applicant thanks the Examiner for the careful reading of this application, for pointing out discrepancies, and for providing suggestions.

Claims 1 and 2 have been rejected as being anticipated by Zimmerman.

Claim 1 has been amended to set forth that each of the commutator legs has a flat structure and is fixed by welding onto the surface of the commutator segment. In the embodiment of Fig. 1, the commutator segment is represented by reference 22, and the commutator leg by reference 26. As one can see from Fig. 1, the commutator leg is a flat structure, and is connected to the surface of the commutator segment 22. Support for the commutator leg being installed on the surface of the commutator segment is also provided in the specification on page 7, first paragraph. The flat structure of the commutator leg is also supported in the specification on page 7 line 13. The welding of the leg to the commutator segment is supported on page 7 lines 20 - 21.

Applicant has reviewed Zimmerman, and finds no teaching nor suggestion of a commutator leg welded on a surface of a commutator segment. Instead Zimmerman shows elements 11 which are connected to elements 1 by an expanding of elements 11 to form shoulders 12. This is done by inserting elements 8 into a slot 6 in element 1, and then expanding the shanks 8 to form the shoulders 12. This is much different from welding, and cannot anticipate welding.

Also elements 11 or shanks 8 are not connected to a surface of element 1, but instead

are connected by the shoulders 7 which are arranged diametrically opposite any surface of element 1. Therefore Zimmerman also does not anticipate the feature of amended claim 1 where the commutator leg part is connected to a surface of a commutator segment. Claim 1 therefore further defines over Zimmerman.

With this Amendment Applicant is adding new independent claim 7 which sets forth a plurality of commutator segments having a segment surface. In the embodiment of Fig. 1, this segment surface is represented by the outside circumferential surface of segments 22. Claim 7 also sets forth that the commutator legs have a flat shape and are welded to the segment surfaces of the commutator segments. As Applicant has described above with regard to claim 1, Zimmerman does not teach nor suggest commutator legs welded to a commutator segment, and especially not welded to a surface of a commutator segment. Claim 7 therefore further defines over Zimmerman.

Claim 8 sets forth that each commutator leg has a base portion and a tip portion where the tip portion is narrower than the base portion. This is shown in the embodiment of Fig. 2. Applicant finds no teaching nor suggestion of elements 11 in Zimmerman to have a base portion and a tip portion where a tip portion is narrower than a base portion. Elements 11 of Zimmerman therefore cannot anticipate the features of claim 8. Claim 8 therefore further defines over Zimmerman.

Applicant also notes that Zimmerman describes a connector in Figs. 5 - 8. However, this connector has clasps 14 which extend out from element 13. The combination of elements 13 and 14 cannot be equated with the tip portion of claim 8, since the combination of elements

13 and 14 appear to be wider than any base portion of the connector.

Claim 15 sets forth that a flatness of the flat shapes of the commutator legs are arranged in a radial plane of the cylindrical shape. As one can see from the embodiment of present Fig. 1, the flatness of the flat shape of legs 26 are arranged in a radially plane of the cylindrical shape. Applicant has reviewed Zimmerman, and finds no teaching nor suggestion of elements 11 having a flatness which is in a radial plane. Claim 15 therefore further defines over Zimmerman.

Applicant notes that commutator bars 1, 1 as disclosed by Zimmerman on page 1 lines 85 - 91 have a special structure for mounting each connector. Each bar 1 is provided with a head portion 5 which defines a slot 6 arranged along a longitudinal axis of the bar 1. The bottom portion of the head 5, is viewed in Fig. 4, is milled or slotted to provide shoulders 7 adjacent the slot 6.

Also each connector 11 has a special structure for assembling in each of the commutator bars 1. As disclosed on page 2, lines 2 - 7 of Zimmerman, the shanks 8, 8 are inserted into the slot 6. The bottom portions of the shanks are then separated by a suitable tool to provide feet 12, 12. These feet 12, 12 will engage the shoulders 7, 7 to prevent outward movement of the connector.

On the contrary, as disclosed in amended claim 1, and new independent claim 7, the commutator leg has a flat structure which is welded to the surface of the commutator segment. This is especially advantageous, especially when the flatness of the flat shape is in a radial plane, because the commutator segment can be shorter, and can also be easily connected to a varistor.

Claims 3 and 4 have been rejected as being obvious over Zimmerman in view of Katagiri. The rejection states that since Zimmerman and Katagiri are from the same field of endeavor, the purpose disclosed by one inventor would have been recognized in the pertinent art of the others. The rejection further states that it would have been obvious at the time the invention was made to include a varistor as taught by Katagiri for the purpose discussed above. Applicant has reviewed Katagiri, and the connectors of Zimmerman. Applicant finds that it would be very difficult to attach the varistor of Katagiri to the connectors of Zimmerman. The connectors of Zimmerman are of such a shape, that a person of ordinary skill in the art would not be led to use any varistor of Katagiri in Zimmerman. Claims 3 and 4 therefore further define over the prior art.

Claim 9 also sets forth a varistor. The varistor is set forth as having a disk shape and defining a hole. The varistor is arranged around the plurality of commutator segments and has a plurality of electrodes soldered to the base portions of the commutator legs. The tip portions of the commutator legs extend radially outwards from the varistor. Applicant notes that because of the shape of the connectors in Zimmerman, it would be very difficult to solder any base portions in Zimmerman to electrodes of any varistor in Katagiri. Therefore it is Applicant's position that it would not be obvious to combine Katagiri and Zimmerman to suggest the combination of claims 3, 4 and 9.

If the Examiner has any comments or suggestions which would further favorable prosecution of this application, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

At this time Applicant respectfully requests reconsideration of this application, and based on the above amendments and remarks, respectfully solicits allowance of this application.

Respectfully submitted
for Applicant,

By:


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Enclosed: Abstract of the Disclosure

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ABSTRACT OF THE DISCLOSURE

Each of the rotor magnetic poles is composed of a winding around a laminated core and each of both ends of each wound wire is connected to a commutator leg part coupled with a tip of a corresponding commutator segment of the commutator unit. Each of the commutator leg parts includes a base portion extending outward in a direction substantially normal to the radial direction from the tip of the corresponding commutator segment tip and coupled to the commutator segment top and a tip portion narrowed stepwise to let the ends of a wound wire be connected. A disk-shaped varistor having a hole at the center is mounted over the base portion of the commutator leg part, and each electrode of the varistor is soldered onto the corresponding base portion. Further, the commutator leg parts are punched and cut out of a reel-wound flat parent metal sheet and fixed to the commutator segment tips.